Amendments to the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

1-15. (canceled)

16. (currently amended) A method of preparing a marker molecule, the method comprising:

(a) labeling a molecule with a label selected from the group consisting of chromophores, fluorophores and UV absorbing groups; and

(b) ligating the molecule to a protein and/or nucleic acid of known molecular weight, wherein the molecule or protein and/or nucleic acid contains ~~an α-thioester~~ a C_α-thioester and the other contains a thiol-containing moiety;

wherein said C_α-thioester and said thiol-containing moiety react to form a peptide bond;

with the proviso that said label is not an amino acid.

17. (currently amended) ~~The method of claim 16, further comprising:~~ A method of preparing a marker molecule composition, the method comprising:

(a) labeling a molecule with a label selected from the group consisting of chromophores, fluorophores and UV absorbing groups;

(b) ligating the molecule to a protein and/or nucleic acid of known molecular weight, wherein the molecule or protein and/or nucleic acid contains a C_α-thioester and the other contains a thiol-containing moiety;

(c) optionally repeating (a)-(b) one or more times to obtain a number of labeled marker molecules of different molecular weights and pIs; and

(d) optionally combining the labeled marker molecules having different molecular weights and pIs;

wherein said C_α-thioester and said thiol-containing moiety react to form a peptide bond;

with the proviso that said label is not an amino acid.

18. (currently amended) The method of claim 16 or 17, wherein said thiol-containing moiety is a 1-phenyl-2-mercaptoethyl group.

19. (currently amended) A method of preparing a marker molecule, comprising:

(a) labeling a molecule ~~comprising an amino terminal cysteine residue~~ with a label selected from the group consisting of chromophores, fluorophores and UV absorbing groups; and

(b) ligating the molecule with a protein and/or nucleic acid of known molecular weight and comprising a C_α-thioester;

wherein said molecule comprises an amino terminal cysteine residue that reacts with said C_α-thioester to form a peptide bond;

with the proviso that said label is not an amino acid.

20. (currently amended) ~~The method of claim 19, further comprising:~~ A method of preparing a marker molecule composition, comprising:

(a) labeling a molecule with a label selected from the group consisting of chromophores, fluorophores and UV absorbing groups;

(b) ligating the molecule with a protein and/or nucleic acid of known molecular weight and comprising a C_α-thioester;

(c) optionally repeating (a)-(b) one or more times to obtain a number of labeled marker molecules of different molecular weights and pIs; and

(d) optionally combining the labeled marker molecules having different molecular weights and pIs;

wherein said molecule comprises an amino terminal cysteine residue that reacts with said C_α-thioester to form a peptide bond;

with the proviso that said label is not an amino acid.

21-38. (canceled)

39. (currently amended) The method of claim 16 or 19, wherein said protein and/or nucleic acid is a protein; and wherein said molecule is a peptide.

40. (cancelled)

41. (currently amended) The method of claim ~~16 or 19~~ 39, wherein the peptide is labeled at lysine residues.

42. (currently amended) The method of claim 39 ~~40~~, wherein the peptide is ~~about~~ 10 to ~~about~~ 100 amino acids in length.

43. (previously presented) The method of claim 39, wherein the protein has a molecular weight of between 3,000 daltons and 250,000 daltons.

44. (withdrawn) The method of claim 16 or 19, wherein the molecule is a nucleic acid.

45. (withdrawn) The method of claim 16 or 19, wherein the labeled marker molecules have the same molecular weight and different pIs.

46. (withdrawn) The method of claim 16 or 19, wherein the labeled marker molecules have the same pI but different molecular weights.

47. (withdrawn) The method of claim 16 or 19, wherein each labeled marker molecule is labeled with a different label.

48. (curently amended) The method of claim 17 or 20 ~~16 or 19~~, wherein each labeled marker molecule is labeled with the same label.

49. (currently amended) The method of preparing a marker molecule according to claim 16 or 19, wherein said marker molecule comprises

(i) a peptide having SEQ ID NO: 3 and having its lysine's epsilon nitrogens attached to ~~TMR~~ tetramethylrhodamine; and

(ii) ~~MBP-95aa~~ a 95-amino acid peptide which is the tripeptide Met-Arg-Met appended to the C-terminus of a peptide that corresponds to residues 1-92 of the 404 amino acid *Escherichia coli* maltose binding protein; and

wherein the amino-terminal cysteine of the peptide having SEQ ID NO: 3 is ligated in a peptide linkage to the carboxy-terminus of ~~MBP-95aa~~ said 95-amino acid peptide.

50. (new) The method of claim 16 or 19, wherein said label is selected from the group consisting of 5-carboxyfluoresceine (FAM), fluorescein, fluorescein isothiocyanate, 2'7'-dimethoxy-4'5'-dichloro-6-carboxyfluorescein (JOE), rhodamine, N,N,N',N'-tetramethyl-6-carboxyrhodamine (TAMRA), tetramethyl rhodamine and carboxytetramethylrhodamine (TMR).

51. (new) The method of claim 39, wherein said C_α-thioester is on the carboxyl-terminus of said protein and said thiol containing moiety is on the amino-terminus of said peptide.

52. (new) The method of claim 16 or 17, wherein said thiol-containing moiety is an N-terminal cysteine.